PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

03 NOV 2004

PCT

NOTIFICATION OF TRANSMITTAL OF COPIES OF TRANSLATION OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 72.2)

To:

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JAPON

Date of mailing *(day/month/year)* 14 October 2004 (14.10.2004)	
Applicant's or agent's file reference PH-1733-PCT	**IMPORTANT NOTIFICATION**
International application No. PCT/JP2003/001917	International filing date *(day/month/year)* 21 February 2003 (21.02.2003)
Applicant KUMIAI CHEMICAL INDUSTRY CO., LTD. et al	

1. **Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

2. **Transmittal of the copy of the translation to the elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

AZ, CA, CH, CN, CO, EP, GH, KG, KP, KR, MK, MZ, RO, RU, TM

The following elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, BA, BB, BG, BR, BY, BZ, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, ES, FI, GB, GD, GE, GM, HR, HU, ID, IL, IN, IS, JP, KE, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MN, MW, MX, NO, NZ, OA, OM, PH, PL, PT, SC, SD, SE, SG, SK, SL, TJ, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

3. **Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

HIRAKI
OCT. 18.2004
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with thanks

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Yoshiko Kuwahara
Facsimile No.+41 22 740 14 35	Facsimile No.+41 22 338 90 90

Form PCT/IB/338 (July 1996)

Translation

PCT Application
PCT/JP2003/001917

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PH-1733-PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/JP03/01917	International filing date (*day/month/year*) 21 February 2003 (21.02.03)	Priority date (*day/month/year*) 29 March 2002 (29.03.02)
International Patent Classification (IPC) or national classification and IPC C12N 15/29, 9/88, 15/60, 5/14, A01H 5/00		
Applicant KUMIAI CHEMICAL INDUSTRY CO., LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand 02 April 2003 (02.04.03)	Date of completion of this report 06 August 2003 (06.08.2003)
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP03/01917

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-50,53, as originally filed
pages _____, filed with the demand
pages 51,52, filed with the letter of 23 July 2003 (23.07.2003)

☒ the claims:

pages 2-4,7, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages 1,5,6,8, filed with the letter of 18 June 2003 (18.06.2003)

☒ the drawings:

pages 1-34, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the sequence listing part of the description:

pages 1-56, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/JP03/01917

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations

Document 1: WO, 1-85970, A2 (Louisiana State University and Agricultural and Mechanical College), 15 November, 2001 (15.11.01), & EP, 1280928, A2, & AU, 200161358, A
Document 2: "A Naturally Occurring Point Mutation Confers Broad Range Tolerance to Herbicides That Target Acetolactate Synthase," (P. Bernasconi, et al.), J. Biol. Chem., 1995, Vol. 270, No. 29, pages 17381-17385
Document 3: "Intragenic Recombination in the CSR1 Locus of Arabidopsis," (G. Mourad, et al.), Mol. Gen. Genet., 1994, Vol. 243, No. 2, pages 178-184
Document 4: "Biosynthesis of 2-aceto-2-hydroxy Acids: Acetolactate Synthases and Acetohydroxyacid Synthases, (David Chipman, et al.), Biochim. Biophys. Acta, 1998, Vol. 1385, pages 401-419
Document 5: "Role of Tryptophanyl Residues in Tobacco Acetolactate Synthase," (C.K. Chong, et al.), Biochem. Biophys. Res. Commun., 1999, Vol. 259, No. 1, pages 136-140
Document 6: "Amino Acid Residues Conferring Herbicide Tolerance in Tobacco Acetolactate Synthase," (C.K. Chong, et. al.), Biochem. Biophys. Res. Commun., 2000, Vol. 279, No. 2, pages 462-467
Document 7: "The Molecular Basis of Sulfonylurea Herbicide Resistance in Tobacco," (Kathleen Y. Lee, et al.), The EMBO J., 1988, Vol. 7, No. 5, pages 1241-1248

Claims 1-8

The subject matters of claims 1-8 do not appear to involve an inventive step in view of documents 1-7 cited in the ISR.

Document 1 describes *Oryza sativa*-herbicide tolerant ALSs (1) identical with the amino acid sequence represented by SEQ ID NO:2 of the present application except 171st His and 172nd Ser, (2) identical with the amino acid sequence represented by SEQ ID NO:4 of the present application except 171st His (identical also in the 548th mutation of the invention of the present application), (3) identical with the amino acid sequence represented by SEQ ID NO:6 of the present application except 171st His (identical also in the 627th mutation of the invention of the present application), and (4) identical with the amino acid sequence of SEQ ID NO:8 of the present application except 171st His (identical also in the 548th and 627th mutations of the invention of the present application).

Document 2 describes to the effect that a point mutant of an ALS acquires tolerance to sulfonylurea-based herbicides, imidazolinone-based herbicides, PC herbicides and triazolopyrimidine-based herbicides. Document 3 describes (1) to the effect that a point mutant of *Arabidopsis thaliana* ALS acquires herbicide tolerance, (2) to the effect that the resistance to PC-based herbicides can also be conferred because of a point-mutated site, and (3) to the effect that in both herbicide-tolerant *Arctium lappa* ALS and *Zea mays* ALS, Trp552 is mutated into Leu.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of : V

Document 4 describes an alignment diagram of ALS sequences of various species, and shows active sites and sites of mutation to confer SU herbicide tolerance. The document also describes to the effect that the mutations of P173S of *Brassica napus*, P197S, S653N, M124I and R199E of *A. thaliana* and P196Q of *Nicotiana tabacum* confer herbicide tolerance.

Document 5 describes to the effect that in *Nicotiana tabacum* ALS, a mutation from Trp573 into Phe could confer herbicide tolerance.

Document 6 describes to the effect that in *Nicotiana tabacum* ALS, point mutations of Ala121, Pro187 and Ser652 could confer herbicide tolerance.

Document 7 describes to the effect that in a herbicide-tolerant mutant of *Nicotiana tabacum* ALS, Pro196 had been mutated into Gln and Ala, while Trp573 had been mutated into Leu.

As described in document 4, as of the priority date of the present application, the amino acid sequences of ALSs of various species, highly preservative sequence sites, active sites and sites of mutation to confer herbicide tolerance are publicly known. Furthermore, from documents 1-7, it is publicly known that if an ALS is point-mutated, it can have herbicide tolerance and acquire PC-based herbicide tolerance. From documents 2-7, it is publicly known that if Pro, Ser, Trp, Ala, Met or Arg is substituted in an amino acid sequence encoding an ALS, herbicide tolerance can be acquired. So, a person skilled in the art could have easily conceived of (1) mutating a site known to confer herbicide tolerance for further enhancing herbicide tolerance in the herbicide-tolerant mutants of *Oryza sativa* ALS described in document 1, and (2) mutating the portion of Pro, Ser, Trp, Ala, Met or Arg as the target of point mutation.

Moreover, as of the priority date of the present application, it is considered to have been well-known techniques in this field, (1) to integrate a publicly known DNA into a vector, (2) to integrate the vector into a host cell for transformation, and (3) to prepare an antibody against a peptide having a known sequence. So, it would have been easy to prepare a vector of a mutated ALS gene of *Oryza saliva*, and to transform the said vector into a host cell.

The effects achieved by the subject matters of claims 1-8 of the present application are considered to be predictable.